THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A sensor for sensing and/or monitoring at least one property associated with transformation of a biochemical analyte by at least one microorganism, said sensor comprising:

at least one fibre optic member having at least one unclad portion;

a coating applied to the at least one unclad portion;

a precursor associated with the coating, said precursor transformable by the at least one microorganism;

wherein

transformation of the precursor produces a spectroscopically detectable indicator of the at least one property.

2. The sensor of claim 1 wherein the unclad portion of the fibre optic member is a declad portion.

3. The sensor of claim 1 comprising a plurality of unclad portions.

4. The sensor of claim 3 further comprising two or more separate fibre optic members.

5. The sensor of claim 1 further adapted to cooperate with analysis means for determining the presence of the spectroscopically detectable indicator.

6. The sensor of any one of the proceeding claims wherein the coating is a glass film.

7. The sensor of the proceeding claim wherein the glass film is both porous and thin.

8. The sensor of any one of the proceeding claims wherein the precursor is immobilised within the coating.

9. The sensor of the proceeding claim wherein the precursor comprises one or more of D-mannitol, carbol fuchsine, methylene blue, sucrose or other suitable compound.

10. The sensor of claim 1 wherein transformation of the precursor results in a product which cooperates with an adjunctive compound to produce the spectroscopically detectable indicator.

11. A sensor system for sensing at least one property associated with transformation of a precursor by one or more microorganisms, said sensor system comprising:

a fibre optic member having at least one unclad portion of optic fibre;

a coating applied to the at least one unclad portion;

a precursor associated with the coating, said precursor transformable by at the one or more microorganisms;

a light source adapted to cooperate with a first end of the fibre optic member to provide input light to the fibre optic member; and

monitoring means adapted to cooperate with the unclad portion to detect an indicator signal in received light from the fibre optic member, said indicator signal indicative of the at least one property;

wherein

transformation of the precursor by the one or more microorganisms produces the indicator signal by interaction with the input light to produce the received light.

12. The sensor system of claim 12 wherein interaction with the light is interactive with an evanescent wave form of the input light.

13. A method of producing a sensor, said method comprising the steps of:

decladding one or more sections of a core of a fibre optic member;

applying a coating to the one or more sections, said coating immobilising a

precursor to a spectroscopically detectable indicator, the precursor transformable to the detectable indicator by the activity of one or more microorganisms.

14. A method of identifying the presence of at least one type of microorganism comprising the steps of:

activating a light source in cooperating relationship to a first end of a sensor according to any one of claims 1 to 11;

monitoring the electromagnetic output from a coated unclad section;

locating the sensor with its coated unclad section in contact with the sample; and

analysing the electromagnetic output to determine the presence of the at least one type of microorganism.

15. The method of claim 14 wherein monitoring the electromagnetic output comprises spectroscopically monitoring the electromagnetic output.

16. The method of either one of claim 14 or claim 15 wherein analysing the electromagnetic output comprises conducting absorption analysis to identify wave lengths of peak absorption of electromagnetic output.

17. The method of claim 16 wherein analysis of the electromagnetic output includes operating a programmable device programmed to receive digital information from a spectroscope and provide an analysis of results.

18. The method of claim 17 wherein the programmable device is programmed to identify one or more features of the at least one microorganism, the one or more features being selected from a group including genus of microorganism, species of microorganism, variety of microorganism, concentration of microorganism and speed of development of indicator.

19. The method of claim 18 wherein the programmable device is further programmed to ascribe an index value to each identified feature and provide an

overall index for a sample according to the algorithm

$$C_5 = \Sigma Iv$$

where:

C = an overall index

Iv = individual indices.

ART 34 AMDT

Added claims

20. A method of coating a sensor for sensing and/or monitoring at least one property associated with transformation of a biochemical analyte by at least one microorganism, comprising steps of:

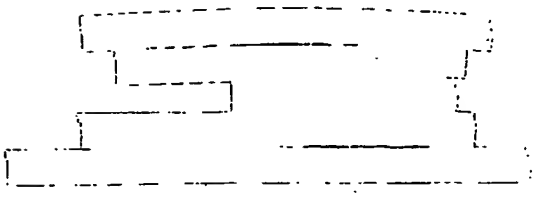
making a coating mixture by dispersing a precursor in a sol-gel solution; wherein the precursor is transformable by the at least one microorganism; and

coating the sensor with the coating mixture; wherein the sensor comprises at least one fiber optic member having at least one unclad portion, and the coating is preferably applied to the unclad portion.

21. The method of coating a sensor of claim 20, wherein the sol-gel solution is made by hydrolysis of Tetra Ethyl Ortho Silica; wherein the molecule used for hydrolysis is selected from the group consisting of H_2O, anhydrous ethanol, and hydrochloric acid.

22. The method of coating a sensor of any of claims 20-21, wherein the sol-gel coating is done by dip coating.

23. The method of coating a sensor of any of claims 20-22, wherein the precursor is selected from the group consisting of D-mannitol, carbol fuchsine, methylene blue, and sucrose.



24. The method of coating a sensor of any of claims 20-23, wherein the resultant product from the transformable precursor cooperates with an adjunctive compound to produce the spectroscopically detectable indicator.